



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,399	06/06/2006	Arnulf Krogdala	43315-226893	8479
26694	7590	12/07/2010	EXAMINER	
VENABLE LLP P.O. BOX 34385 WASHINGTON, DC 20043-9998			JOHNSON, MATTHEW A	
ART UNIT	PAPER NUMBER			
	3656			
MAIL DATE	DELIVERY MODE			
12/07/2010	PAPER			

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,399	<b>Applicant(s)</b> KROGEDAL, ARNULF
	<b>Examiner</b> MATTHEW A. JOHNSON	<b>Art Unit</b> 3656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 22 September 2010.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-32 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 27 December 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/GS-68)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the gear members having "a negative bevel angle relative to a plane perpendicular to an axis of rotation of said gear member" (claim 1) and one of said gear members "has a positive bevel angle relative to a plane perpendicular to the rotation axis" (Claim 2) and "a longitudinal axis of the inner protection hose passing through the inside of the wrist parts has a same total length when arranged in each of a bent and a straight position" (claim 10), "an internal or external surface treatment or painting tool" (claim 29), "a welding operation tool" (claim 30), "a picking and/or packing tool" (claim 31) and "a machine tending tool" (claim 32), must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. **Note:** Regarding claims 1 and 2, while Figure 4 appears to show a plane P perpendicular to a rotation axis A1 and A2 of the gears, Figures 6a and 6b, which are used by the Applicant to illustrate the "negative bevel angle", show a plane P that is not perpendicular to a rotation axis of the gears. This discrepancy makes it entirely unclear how the "bevel angle" is being measured. Additionally, regarding claim 10, the drawings do not appear to show a longitudinal axis of the inner hose having the same length in the bent and straight positions. It is unclear how a curved line can have the same length as a straight line. Regarding claims 29-32, the drawings do not show a robotic arm having any of the claim end effectors.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claims 8 and 10, are objected to because of the following informalities: The phrase "said gear members has a hollow opening" should read – said gear members have a hollow opening –. Regarding claim 10, it appears the phrase "a longitudinal axis the inner protection hose", should read – a longitudinal axis of the inner protection hose --. The examiner requests Applicant carefully review all of the claims for similar grammatical errors. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10 and 27-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 10: Claim 10 recites the limitation, "a longitudinal axis of the inner protection hose passing through the inside of the wrist parts has the same total length when arranged in each of a bent and a straight position". It is unclear how the longitudinal axis of the hose can have the same total length when in a bent position and a straight position. How can a curved line have the same length as a straight line? As written, the limitation is unclear rendering the claim indefinite.

Re claims 27-28: Claims 27-28 recite the limitations "the first part", "the second part" and "third part". There is insufficient antecedent basis for these limitations in the claims. Does Applicant mean "the first wrist part", "second wrist part" and "third wrist part"? For clarity, Applicant must remain consistent in the use of claim terminology.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 5-6, 8-11 and 24-32, as best understood, are rejected under 35

U.S.C. 102(b) as being anticipated by Dahlquist et al. (USP-4,690,012).

Re claim 1: Dahlquist discloses a robot wrist (10, Fig. 1) with a plurality of rotatable parts (11, 12, 13) arranged in series with each other (Fig. 1), comprising

- a first wrist part (11) arranged in use to be mounted to a robot arm (5) or automation machine to enable rotary movement of the first wrist part about a first axis (D-D),
- a second wrist part (12) journaled in the first wrist part (Fig. 2), wherein each wrist part comprises at least one gear member (67, 68, 37, 69, 73, 74, 60, 27, 55) configured to drive said rotary movement of any of said wrist parts relative to another of said wrist parts, said at least one gear member having a conical surface (bevel gears are conical by nature, Fig. 2), and
- wherein a generatrix of the conical surface of least one of said gear members (one of gears 68, 37, 74) has a negative bevel angle (as shown in Fig. 2, gears 68, 37 and 74 are concave bevel gears having internally formed teeth that are angled inwardly relative to a plane perpendicular to their rotation axis) relative to a plane perpendicular to an axis of rotation of said gear member (Fig. 2).

Re claim 2: Dahlquist discloses at least one of said gear members (one of gears 67, 27, 55, 60) has a positive bevel angle relative to a plane perpendicular to the rotation axis (Fig. 2) and at least one other said gear member (68, 37, 74) has a concave bevel gear with a negative bevel angle (as shown in Fig. 2, gears 68, 37 and 74 are concave bevel gears having internally formed teeth that are angled inwardly relative to a plane perpendicular to their rotation axis).

Re claim 5: Dahlquist discloses each gear member is an annular bevel gear (Fig. 2).

Re claim 6: Dahlquist discloses said second wrist part (12) comprises a bevel gear member (gear 68 or 37, Fig. 2) with the negative bevel angle.

Re claim 8: Dahlquist discloses each of said gear members has a hollow opening through which an inner protection hose is arranged (Fig. 2, C1 L48-50, C2 L8-13, C4 L43-47).

Re claim 9: Dahlquist discloses the inner protection hose is arranged so as to pass through the inside of the wrist parts arranged in a single circular arc when the wrist is in a bent position (Fig. 3).

Re claim 10: Dahlquist discloses a longitudinal axis of the inner protection hose passing through the inside of the wrist parts has the same total length when arranged in each of a bent and a straight position (Figs. 2 and 3).

Re claim 11: Dahlquist discloses the inner protection hose has a substantially cylindrical wall (see C4 L43-47; cable, protective gas conduits and wires are inherently cylindrical).

Re claim 24: Dahlquist discloses the negative bevel angle of the gear member of said second wrist part (gear 68 or 37) is arranged facing a third wrist part (13).

Re claim 25: Dahlquist discloses the third wrist part (13) is journaled in the second wrist part (12) to enable rotary movement of the third wrist part relative the second wrist and the second wrist part relative the first (Fig. 2).

Re claim 26: Dahlquist discloses a gear member (gears 67, 44) of the first wrist part (11) is arranged to engage a gear member (gears 68, 37) of the second wrist part such that the second wrist part (12) rotatably drives a gear member (74) of the third wrist part (13) engaged by a second gear member (73 or 69) of the second wrist part.

Re claim 27: Dahlquist discloses the second part (12) gear members (68 or 37) rotatably driving the third part gear member are arranged in the second part such that their axes of rotation are at an inclined angle to each other (Fig. 3).

Re claim 28: Dahlquist discloses a first part gear member (67, 44) and a third part gear member (60) are convex bevel gears with a positive gear angle (Fig. 3) and a second part gear member (68, 37) is a concave bevel gear with a negative bevel angle (Figs. 2 and 3).

Re claims 29-32: Dahlquist further discloses the robotic wrist comprising an internal or external treatment or painting tool, a welding operation tool, a picking and/or packing tool and a machine tending tool (C1 L20-24)

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012).

Re claims 3-4: While Dahlquist does indeed disclose concave bevel gears (37, 68, 74) that comprises internally formed teeth (i.e. concave) that appear to formed at a negative angle of at least -10 degrees, Dahlquist does not explicitly disclose the angle of the bevel gears.

Dahlquist discloses the claimed invention except for identical ranges as claimed. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have formed the concave bevel gears of Dahlquist with a negative bevel angle within the claimed ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, USPQ 233.

Re claim 7: Dahlquist discloses wherein the negative bevel angle of the gear member (68 or 37) of said second wrist part (12) is arranged to engage a gear member (gears 68, 37 engage gears 67 and 44) of said first wrist part (11).

9. Claims 12-14, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012) in view of Haniya et al. (USP-6,734,367).

Re claims 12-14: While Dahlquist does indeed disclose an inner protection hose (C4 L43-47), Dahlquist does not explicitly disclose the inner protection hose has a cylindrical wall that has a straight and parallel wall cross-section, the inner protection hose has a wall cross-section in the form of a wave, the inner protection hose comprises an articulated hose comprising circular sections of at least two different diameters.

Haniya teaches a protective hose for a robot (see Abstract and Fig. 2) wherein the inner protection hose (10) has a cylindrical wall that has a straight and parallel wall cross-section(see Figs. 1-4), the inner protection hose has a wall cross-section in the form of a wave (Figs. 1-4), the inner protection hose comprises an articulated hose comprising circular sections of at least two different diameters (Figs. 1-4), for the purpose of protecting the inner cables from mechanical damage (C1 L13-26).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have included in the device of Dahlquist, an inner protection hose

Art Unit: 3656

with a cylindrical wall that has a straight and parallel wall cross-section, a wall cross-section in the form of a wave and the hose having circular sections of at least two different diameters, as taught by Haniya, for the purpose of protecting the inner cables from mechanical damage (C1 L13-26).

10. Claims 15-23, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012) in view of Haniya et al. (USP-6,734,367) further in view of Fisher (USP-6390141).

Re claims 15-23: Dahlquist in view of Haniya disclose all of the claim limitations as described above.

While Haniya teaches a plurality of hoses and/or cables are arranged inside said inner protection hose, the plurality of hoses and/or cables are twisted to a predetermined extent through 180 degrees inside the inner protection hose and comprise any from the list of: hose, wire, feed rod, cable (C1 L19-26), Dahlquist in view of Haniya does not disclose the inner protection hose is comprises a polymeric material combined with at least one metal reinforcing member, the inner protection hose comprises a fluoropolymer, the metal reinforcing member comprises a plurality of metal rings, the metal reinforcing member comprises any of a spiral wire or a helical wire, the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material, the rings, spiral wire or helical wire of the hose are embedded in the polymeric material.

Fisher teaches a protective hose (10) formed of a polymeric material (C3 L48-53) combined with at least one metal reinforcing member (C3 L18-22), the inner protection hose comprises a fluoropolymer C3 L48-53), the metal reinforcing member comprises a plurality of metal rings (C3 L10-39), the metal reinforcing member comprises any of a spiral wire or a helical wire (C3 L10-39), the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material (C3 L10-61), the rings, spiral wire or helical wire of the hose are embedded in the polymeric material C3 L10-61), for the purpose of providing a flexible hose that is properly reinforced to prevent collapse of the protective hose (C3 L10-61 and Abstract).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have modified the device of Dahlquist and Haniya, such that the inner protection hose is formed of a polymeric material combined with at least one metal reinforcing member, the inner protection hose comprises a fluoropolymer, the metal reinforcing member comprises a plurality of metal rings, the metal reinforcing member comprises any of a spiral wire or a helical wire, the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material, the rings, spiral wire or helical wire of the hose are embedded in the polymeric material, as taught by Fisher, for the purpose of providing a flexible hose that is properly reinforced to prevent collapse of the protective hose (C3 L10-61 and Abstract).

***Response to Arguments***

11. Applicant's arguments filed 9/22/2010 have been fully considered but they are not persuasive.
12. Applicant argues that Dahlquist does not disclose at least one gear member having a negative bevel angle relative to a plane perpendicular to an axis of rotation of said gear member. Applicant relies on the prior art figure 6b of the instant application, which Applicant claims came from the Dahlquist reference, to support this position. However, Figure 6b labeled prior art by the Applicant, does not match any of the Figures of Dahlquist, and it is unclear where the drawing came from. That which is depicted in prior art Figure 6b is not an accurate illustration of Dahlquist's device. The rejection is based on the Figures actually disclosed by Dahlquist, and not Applicant's representation of the Figures. As clearly shown in annotated Figure 2 reproduced below, Dahlquist discloses a concave bevel gear (37 or 68 or 74) having internal teeth that are angled inward towards the axis of rotation, relative to a plane that is perpendicular to the axis of rotation. Additionally, describing an angle as negative or positive depends on the perspective used to measure the angle. A positive angle from one side of the plane could also be considered to be a negative angle from the other side of the plane.

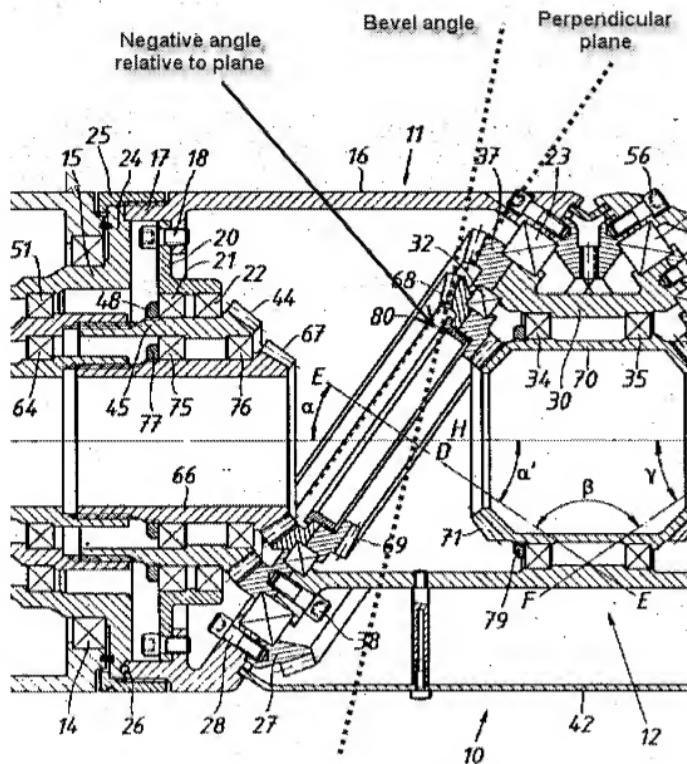


FIG. 2

***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW A. JOHNSON whose telephone number is (571)272-7944. The examiner can normally be reached on Monday - Friday 9:00a.m. - 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW A JOHNSON/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656